CHAPTER 4
SAFETY CONSIDERATIONS

4-1. Safety Precautions.

a. OB/OD operations will be conducted IAW ER 385-1-92, all other applicable DA and USACE safety regulations, and applicable Federal, state, and local safety laws and regulations.

b. OE operations will not be conducted until a complete Work Plan and SSHP for the operation involved is prepared and approved by the OE Design Center. The health and safety plans will be based upon limiting the exposure to a minimum number of personnel, for a minimum time, to the minimum amount of OE, consistent with safe and efficient operations.

c. Plan for, provide, and know the measures to be taken in the event of an accident. Emergency procedures that are to be used in the event of an accident should be thoroughly covered in the project SSHP.

d. Only qualified UXO personnel will be involved in conducting OB/OD operations. Non-UXO trained personnel may be used to perform OB/OD support activities (e.g., soil sampling, trenching, etc.) when supervised by an UXO-qualified individual. All personnel engaged in OE disposal operations will be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive situations.

e. OD operations always produce dangerous overpressures and various types of fragments, depending on the type of explosives being detonated. Consider OE which have been exposed to fire and detonation as extremely hazardous. Chemical and physical changes may have occurred to the contents that render OE much more sensitive than it was in its original state.

f. Open air burning or detonation of munitions, explosives and pyrotechnics for the purpose of destruction is prohibited between sunset and dawn.

g. Medical and First Aid Requirements. Prior to the start of work, arrangements will be made for medical facilities and personnel to provide prompt attention to the injured and for consultation on occupational safety and health matters.

(1) Communication and transportation to effectively care for injured workers will be provided.

(2) The telephone numbers of physicians, hospitals, or ambulances will be conspicuously posted (at the minimum, these numbers will be posted at the on-site project office telephones).

(3) When any part of the body may be exposed to toxic or corrosive materials, drenching and/or flushing facilities will be provided in the work area for immediate use.

(4) A first aid kit will be present during all OB/OD operations. The contents of the first aid kit will, at a minimum, include those items required to handle burns and puncture wounds.

h. Lightning Suppression. All explosive storage areas will be equipped with a lightning suppression system that meets the guidelines of Chapter 7 of DOD 6055.9-STD.

i. OB Specific Requirements.

(1) When destroying explosives by burning, the possibility that the mass may detonate must be recognized and appropriate protective barriers or distance separation should be used for the protection of personnel and property.

(2) Personnel engaged in OB operations will be provided with flame resistant clothing.

(3) Disposal by open burning will not be undertaken when wind velocity exceeds 15 mph.

4-2. Physical Security.

a. Physical security requirements for OB/OD operations are governed by applicable Federal, state, and local regulations. The physical security requirements will, at a minimum, meet the requirements specified in ATFP 5400.7.

b. A physical security survey will be conducted by the contractor prior to construction of an explosives storage area. This survey will determine the fencing and lighting requirements that will be necessary for the explosives storage area.

c. The number of entrances and exits to the OB/OD area will be limited to the fewest number practicable to limit access to the area. Unauthorized persons will not be permitted to enter the OB/OD area during operations. Authorized persons must enter and leave the OB/OD area at the designated points. The OB/OD area will be separated from administrative, residential, and other public areas by as much distance as possible.

d. All personnel entering the OB/OD area must be briefed by the Site Safety and Health Officer on the hazards present at the site and the safety protocols in force at the site. The same protocols will be used for entry of personnel into the project exclusion zone. Prior to the start of operations, the exclusion zone will be searched for unauthorized personnel. An adequate number of guards will then be posted to prevent unauthorized entry into the disposal area. The guards will be posted at a distance to afford protection from blast and fragments. A means of communication will be maintained between all site personnel during the conduct of the operations to ensure that unauthorized personnel do not stray into the area. All entrances to the OB/OD area will also be guarded during the conduct of the operation to ensure unauthorized personnel do not enter the area. The exclusion zone will again be checked for any unauthorized personnel at the end of each day's operation. The topography of the OB/OD area will be used to the maximum extent practicable to ensure the safety and security of the OB/OD operation.

e. A warning sign will be posted at each entrance to the OB/OD area to warn the public to stay out of the site. The warning signs will be designed and maintained IAW the following specifications:

(1) The design of warning signs must consider the wording, size, and color. The wording of the sign must be concise, legible, easily understood, and positive. In those cases where the OB/OD site is sited in an area with a bilingual population, the sign wording must also be bilingual with the common second language of the local population. The size of the sign is determined by its purpose, location, quantity of wording, and distance from which it should be legible. The color of the sign is dependent on the sign's function.

(2) Signs must be kept in good condition, clean, well illuminated and legible. Signs shall be made of metal, plastic, or durable weather resistant materials.

(3) Danger signs will be used on an OB/OD site. The danger sign will have a white background with a black rectangle in the top portion. Inside the black rectangle will be a red oval containing the word "DANGER" in white letters. The size of this part of the sign will vary proportionally with the overall dimensions of the sign. Figure 4-1 is an example of a danger placard. Table 4-1 presents danger sign dimensions. The sign wording will be located in the remaining portion of the sign. The wording will be in black letters on the white background. The wording must convey all necessary information, but be kept as brief as possible. Phosphorescent or retroreflective paint will be used in locations where night visibility is required.

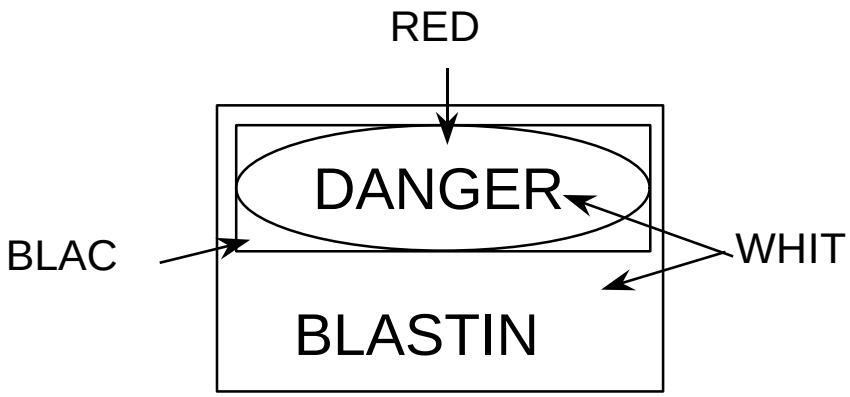

FIGURE 4-1: Example Warning Sign

TABLE 4-1

Danger Sign Dimensions (inches)[1]

Sign Size	Black Rectangular Panel	Red Oval	Word "Danger"	Maximum Message Space
Horizontal Pattern				
7 x 10	3 1/4 x 9 3/8	2 7/8 x 8 1/2	1 7/16	1 3/4 x 9 3/8
10 x 14	4 3/8 x 13 3/8	4 1/8 x 11 7/8	2 1/6	4 1/4 x 13 3/8
14 x 20	6 1/2 x 19 3/8	5 3/4 x 17	1 7/8	6 1/4 x 19 3/8
20 x 28	9 1/4 x 27 3/8	8 1/4 x 23 7/8	4 1/8	9 1/8 x 27 3/8
Upright Pattern				
10 x 7	2 3/8 x 6 3/8	2 1/8 x 5 7/8	1 1/18	6 3/8 x 6 3/8
14 x 10	3 1/4 x 9 3/8	2 7/8 x 8 1/2	1 7/18	9 1/2 x 9 3/8
20 x 14	4 5/8 x 13 3/8	4 1/8 x 11 7/8	2 1/16	14 x 13 3/8
28 x 20	6 1/2 x 19 3/8	5 3/4 x 17	1 7/8	10 1/4 x 19 3/8

[1] From AR 385-30.

4-3. Personnel/Training Requirements.

a. Only UXO-qualified personnel will conduct OB/OD operations.

b. Personnel employed at the OB/OD area will be thoroughly trained regarding the nature of the materials handled, the hazards involved, and the precautions necessary. The danger of using unapproved, improvised methods and other deviations must be thoroughly instilled in the minds of the employees. It is essential that thorough training and vigilant supervision be provided during all OB/OD operations.

c. All personnel performing on-site work activities, wherein they may be exposed to hazards resulting from OB/OD operations, will have completed applicable training in compliance with 29 CFR 1910, 29 CFR 1926, ER 385-1-92, and EM385-1-1. Although OSHA regulations at 29 CFR 1910.120 and 29 CFR 1926.65 permit varying levels of training based on employee responsibility and exposure potential, it is the policy of USACE to require that all personnel engaged in OB/OD operations obtain training IAW ER 385-1-92.

d. First Aid and CPR Training.

(1) When a medical facility or physician is not accessible within five minutes of the work site, at least two employees on each shift will be qualified to administer first aid and CPR.

(2) Employees designated as responsible for rendering first aid or medical assistance will be:

(a) included in their employer's blood-borne pathogen program IAW 29 CFR 1910.1030;

(b) instructed in the sources, hazards, and avoidance of blood-borne pathogens; and

(c) provided, use, and maintain personal protective equipment when appropriate for rendering first aid or other medical assistance to prevent contact with blood or other potentially infectious materials.

4-4. Material Awaiting Destruction. Material awaiting destruction will be stored in an explosives storage magazine that meets the criteria of ATFP 5400.7 and sited in accordance with DoD 6055.9-STD.

4-5. Emergency Equipment.

a. Before the start of OB/OD operations an Emergency Response Plan, which complies with 29 CFR 1910.120(l), 29 CFR 1926.65(l) will be developed and implemented. The Emergency Response Plan will address, at a minimum, the following areas:

(1) pre-emergency planning and procedures for reporting incidents to appropriate government agencies for potential chemical exposures, personal injuries, fires/explosions, environmental spills and releases, and discovery of radioactive materials;

(2) personnel roles, lines of authority, and communications;

(3) posted instructions and list of emergency contacts, including the following: physician/nearby medical facility, fire and police departments, ambulance service, Federal/state/local environmental agencies, CO, or approving authority for in-house activities;

(4) emergency recognition and prevention;

(5) site topography, layout, and prevailing weather conditions;

(6) criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency personal protective equipment (PPE), safe distances, place of refuge, evacuation routes, site security, and control);

(7) specific procedures for decontamination and medical treatment of injured personnel;

(8) route maps to nearest pre-notified medical facility;

(9) criteria for initiating community alert program, contacts, and responsibilities; and

(10) critique of emergency responses and follow-up.

b. Local fire/police/rescue authorities having jurisdiction and nearby medical facilities that will be utilized for emergency treatment of injured personnel will be contacted before the start of OB/OD operations in order to notify them of upcoming site activities and potential emergency situations, to ascertain their response capabilities, and to obtain a response commitment.

c. The following items, as appropriate, will be immediately available for on-site use during the conduct of OB/OD operations:

(1) first aid equipment and supplies approved by the consulting physician;

(2) fire extinguishers; and

(3) emergency eyewashes/showers (as necessary).

d. First Aid Kits. Unless otherwise specified, first aid kits will be 16-unit first aid kits. First aid kits will comply with 29 CFR 1910.151 and 1926.50, be constructed of weatherproof containers, and be easily accessible to all workers with each item maintained in a sterile condition. The contents of the first aid kits will be checked by the employer prior to their use and at least weekly when work is in progress to ensure that expended items are replaced.

e. During OB/OD operations, a designated emergency vehicle will be provided in the area in case of an accident or other emergency.

4-6. Communications.

a. The OB/OD area will be serviced with telephones or two-way radio communications. If available, a permanent structure serviced with electricity and hard-wire communications will be used.

b. The use of electro-explosive devices (EED) susceptible to electromagnetic radiation (EMR) devices in the radio frequency (RF) range, that is, radio, radar, and television transmitters, has become almost universal. Some ordnance is particularly susceptible to EMR/RF emission. A knowledge of ordnance that is normally unsafe in the presence of EMR/RF is important so that preventive steps can be taken if the ordnance item is encountered in a suspected EMR/RF environment. The presence of antennas, communication, and RADAR devices should be noted during the initial site visit or during the preliminary assessment. When potential EMR hazards exist, the site will be electronically surveyed for EMR/RF emissions and the appropriate actions taken. Minimum safe distances from EMR/RF sources are listed in Tables 3-2, 3-3, and 3-4 of this EP.

4-7. Fire Prevention Planning.

a. Fire Prevention Plan. A fire prevention plan will be prepared as part of the SSHP. This plan will, at a minimum, include the following items.

(1) The fire prevention plan will specifically cover the explosives storage area and any temporary storage magazine used on site and will be coordinated with the local fire department. Placarding of the explosives storage area and any temporary magazines will be IAW Federal, state, and local regulations.

(2) The fire prevention plan will show the fire lanes providing access to all critical areas. These fire lanes will be maintained free of obstruction.

(3) The fire prevention plan will state that all vehicles, equipment, materials, and supplies will not be placed so that access to fire hydrants or other fire fighting equipment is obstructed.

(4) The fire prevention plan will be coordinated with the local fire department during the plan preparation phase of a project. During this coordination the capabilities of the local fire department must be determined, particularly the local fire department's capabilities to battle ordnance-related fires.

(5) The fire prevention plan will discuss how fire-fighting capabilities will be readily available to extinguish brush or grass fires.

(6) The fire prevention plan will designate the location of smoking areas at the site. Smoking may take place only in the specifically designated and posted "Smoking Locations". Smoking will be prohibited in all areas where flammable, combustible, or oxidizing materials are stored. "NO SMOKING OR OPEN FLAME" signs will be posted in all prohibited areas.

(7) The fire prevention plan will designate that all sources of ignition will be prohibited within 15 meters (50 feet) of operations with a potential fire hazard. The potential fire hazard area will be conspicuously and legibly posted with a sign stating "NO SMOKING OR OPEN FLAME".

b. Ensure that the fire prevention plan is read and understood by all personnel working on the site. Also ensure that each person knows what to do in case of fire within the work area. The person in charge should instruct all personnel on the existing fire plan to aid fire fighting crews and to prevent the loss of life and property in case of an accident.

c. Only OE-trained fire fighters will assist in fires involving ammunition and explosives. If the practical need for their doing so can be anticipated, the local fire fighters will receive advance instruction in ammunition and explosives fire fighting procedures.

d. OB Specific Requirements.

(1) OB areas will be established in coordination with the local authorities and with the agency responsible for monitoring fire potential at the location of the proposed OB area.

(2) OB operations will be conducted in compliance with all applicable Federal, state, and local regulations and guidelines.

(3) A sufficient force necessary to patrol and control the burning operations will be maintained until the last embers have been extinguished.

4-8. Airspace Clearance. The proposed site for the OB/OD operation must not conflict with any existing or proposed airways. Written clearance for the proposed OB/OD site will be obtained from the appropriate local Federal Aviation Administration administrator.

4-9. Personnel Protection.

a. Hazard Assessment. When setting up an OB/OD area, a hazard assessment will be performed to determine the hazards that will be associated with performing OB/OD operations in the area. Based on this assessment, engineering design criteria for the OB/OD area will be developed for use in the selection of appropriate equipment, shielding, engineering controls, and protective clothing for personnel. The hazard assessment will include the following factors, as appropriate:

(1) initiation sensitivity;

(2) quantity of materials to be destroyed;

(3) heat output;

(4) rate of burning;

(5) potential ignition and initiation sources;

(6) protection capabilities of shields, the types of clothing to be worn, protection systems; and

(7) the physiological effects of hot vapors and combustion products on exposed personnel.

b. Personal Protective Equipment.

(1) PPE Plan. A PPE Plan will be developed as part of the SSHP. The PPE Plan will address:

(a) PPE selection based on site-specific hazards;

(b) the use and limitations of PPE;

(c) OB/OD activity duration;

(d) the maintenance and storage of PPE;

(e) the decontamination and disposal of PPE;

(f) PPE training and fitting;

(g) equipment donning and doffing procedures;

(h) procedures for inspecting equipment before, during, and after use;

(i) an evaluation of the effectiveness of the PPE program; and

(j) medical considerations, including work limitations due to temperature extremes.

(2) PPE selected to be used on a site will be based on the performance characteristics of the equipment relative to:

(a) the requirements and limitations of the site;

(b) the task specific conditions and duration of the operation; and

(c) the hazards and potential hazards identified at the site.

c. Personnel working in an OB/OD area will have ample time to exit the exclusion zone prior to detonation.

d. OB/OD operations will be discontinued and personnel moved to a safe area during the approach or progress of a thunderstorm or dust storm. Controls will be established to prevent the accidental discharge of electric blasting caps from extraneous electricity.

e. Personnel working with OE will only wear outer and undergarments made of 100 percent cotton material in order to minimize the static that can be generated by other fabrics. Materials of 100 percent polyester, nylon, silk, or wool are highly static-producing and are therefore prohibited when performing OB/OD operations. Any person handling a UXO suspected of containing EEDs will ground himself/herself prior to touching the UXO. See DA PAM 385-64, Paragraph 6-10.a.(4) for additional information on non-static producing attire.

f. When working with munitions, personnel are required to observe the following precautions:

(1) do not carry fire or spark-producing devices into ammunition or explosives work areas unless authorized in writing;

(2) do not smoke, except in authorized area. After smoking, ensure that burning tobacco is completely extinguished;

(3) do not have fires for heating or cooking, except in authorized areas;

(4) do not allow accumulation of litter, packing material, dunnage, dry leaves, grass, etc. within fire-break areas;

(5) pick up any debris within storage area;

(6) do not accumulate oily rags or other material subject to spontaneous ignition, except in a covered metal box. Have such material collected daily and removed from the area;

(7) do not conduct OB/OD operations without the OE Design Center approved Work Plan and SSHP in place and under proper supervision;

(8) use only permissible lighting in the temporary magazines and explosive storage areas;

(9) do not become careless by reason of familiarity with ammunition; and

(10) personnel will never work alone during OB/OD operations. Warning signs or roadblocks will restrict entry to the area. One person, available in an emergency, should observe from a safe distance while another person performs the operation.

g. Personnel will wear clothing suitable for the weather and work conditions: the minimum for field work will be short sleeved shirt, long trousers, and leather or other protective work shoes or boots.

h. For all activities in which USACE or contractor personnel or official visitors are potentially exposed to foot hazards, the applicable position/activity hazard analysis, accident prevention plan, or project SSHP will include an analysis of and prescribe specific protective measures to be taken for reducing foot hazards.

i. Personnel will be provided with eye and face protection equipment when operations present potential eye or face injury from physical, chemical, or radiation agents.

j. OB Specific Requirements. Personnel engaged in OB activities will be provided with fire resistant clothing. Until authorized flame-resistant clothing is available, clothing may be flame-proofed by immersion in an approved flame-proofing solution. Effective flame-proofing solutions are: (1) a 15 percent aqueous solution of diammonium phosphate or ammonium sulfamate or (2) a solution of 2 pounds of ammonium sulfate, 4 pounds of ammonium chloride and 3 gallons of water. These are minimum effective percentages; stronger solutions may be used without effect on wearing life of the clothing. During operations, the number of people in the area exposed to the hazard should be kept to a minimum, but no fewer than two.

4-10. Toxic Hazards of Certain Explosives and Munitions. Many explosives, because of their chemical structures, are somewhat toxic. When munitions are destroyed, careful attention must be paid to the toxic nature of some of the munitions as the toxic effects of munition destruction can vary from mild dermatitis or a headache to serious damage to internal organs. All personnel should remain outside the PSD until all smoke and fumes dissipate.